UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,563	10/16/2003	Yong-suk Kim	Q75993	7176

23373 7590 02/27/2007

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
SHARMA, SUJATHA R	
ART UNIT	**PAPER NUMBER**
2618	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/685,563	KIM ET AL.	
	Examiner	Art Unit	
	Sujatha Sharma	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/6/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kalia [Vehicular technology conference proceedings, 2000 VTC 2000-Spring Tokyo, 2000 IEEE, pages 716-720 vol. 2] in view of Yang-Ick Joo [Vehicular technology conference proceedings, 2002 VTC 2002-Fall, 2002 IEEE, pages 2445 – 2448 vol. 4].

Regarding claim 1, Kalia discloses a method a method of data scheduling and scheduling policies for Bluetooth media access control (MAC). Kalia further discloses a method comprising:

- a queue status detection unit for detecting an amount of unit data used for communicating among a plurality of external devices (see abstract and page 717, paragraphs 6 and 7) and determining a class parameter T of said one of the plurality of external devices (see page 718, paragraph 5)
- a counter for counting a number of giving-away times of said one of the plurality of external devices based on the giving-away of communication opportunities to communicate with the plurality of external devices; Here giving away time is the time the external device sacrifices when it has no data to send and gives its time slot to another external device. See page 717, last paragraph.

- a communication priority decision unit for calculating priority values P of said one of the plurality of external devices by using the class parameter and the delay parameter, and determining which of the plurality of external devices has priority, based on the priority values; see page 718, paragraphs 5 and 6 (here the time of arrival of the packets indicates the delay parameter).
- a communication initiation unit for initiating data communications with the determined external device having the priority. See page 717, last paragraph.

However, Kalia does not specifically disclose a method of determining the delay parameter (D) of said one of the plurality of external devices.

Yang Ick Joo, I the same field of endeavor, teaches a method of an efficient and QoS aware scheduling policy for Bluetooth. He further discloses a method determining the delay parameter (D) of said one of the plurality of external devices. See page 2446, section III.

Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to provide the above teachings of Yang Ick Joo to Kalia in order to improve system performance by considering the traffic characteristics such as he delay parameter.

Regarding claim 2, Yang Ick Joo further discloses a method wherein the communication priority decision unit calculates the priority values based on a Formula, as follows:

$P = aT + (1- a)D$

where a denotes a weighted value, T denotes a class parameter, and D denotes a delay parameter. See page 2446, section III.

Regarding claim 3, Kalia further discloses a method comprising a comparison unit for comparing a maximum priority value with a priority value of a first external device and the priority values of the plurality of external devices, wherein, when the priority value of the first external device is smaller than the maximum priority value, the communication priority decision unit determines that a second external device has the maximum priority value and an opportunity for transmission, and the communication initiation unit initiates communication with the second external device. See page 717, section A – Priority and K-fairness policies for TDD MAC layer. Here it is determined that the maximum priority connection is Master-slave connection in the 1-1 state. Further when it is determined that when the Master-Slave connection of the other external devices is at 1-0 or 0-1 state, the connection is sacrificed to a 1-1 connection state thus allowing the second device with 1-1 state to continue with the transmission.

Regarding claim 4, Kalia further discloses a method wherein, when initiating communications with the second external device, the queue status detection unit detects an amount of unit data being sent to/from the second external device, and changes a class parameter of the second external device (see page 718, paragraph 5 where according to amount of data to be sent or otherwise according to slot utilization, Master-Slave pairs are divided into different classes), and the counter decreases the number of giving-away times of the second external device and increases the number of giving-away times of the first external device so as to change delay parameters of the first and second external devices (see page 717, last paragraph)

Regarding claim 5, Kalia further discloses a method wherein the communication priority decision unit updates the, priority values of the first and second external devices by using the changed class parameter and delay parameters. See page 718, paragraphs 5 and 6 (here the time of arrival of the packets indicates the delay parameter).

Regarding claim 6, Kalia further discloses a method wherein, if the priority value of the first external device equals the maximum priority value, the communication priority decision unit determines that the first external device has an opportunity for transmission, and the communication initiation unit initiates communications with the first external device. See page 717, last paragraph.

Regarding claim 7, Kalia further discloses a method wherein, when initiating communications with the first external device, the queue status detection unit detects an amount of unit data being sent to/from the first external device, and changes a class parameter of the first external device. See page 718, paragraph 5 where according to amount of data to be sent or otherwise according to slot utilization, Master-Slave pairs are divided into different classes.

Regarding claim 8, Kalia further discloses a method wherein the communication priority decision unit updates the priority value of the first external device by using a changed class parameter. See page 718, paragraphs 5 and 6.

Regarding claim 9, Kalia further discloses a method comprising:

- detecting an amount of unit data used for communicating among a plurality of external devices, and determining a class parameter of one of the plurality of external devices; See page 718, paragraph 5 where according to amount of data to be sent or otherwise according to slot utilization, Master-Slave pairs are divided into different classes.
- counting the number of giving-away times of said one of the plurality of external devices based on the giving-away of communication opportunities to communicate with at least one other of said plurality of external devices; Here giving away time is the time the external device sacrifices when it has no data to send and gives its time slot to another external device. See page 717, last paragraph.
- calculating priority values P of said one of the plurality of external devices by using the class parameter and the delay parameter, and determining whether said one of the plurality of external devices has priority over said at least one other of said plurality of external devices, based on the priority values; see page 718, paragraphs 5 and 6 (here the time of arrival of the packets indicates the delay parameter).
- initiating data communications with a determined external device that has the higher priority. See page 717, last paragraph

However, Kalia does not specifically disclose a method of determining the delay parameter (D) of said one of the plurality of external devices.

Yang Ick Joo, I the same field of endeavor, teaches a method of an efficient and QoS aware scheduling policy for Bluetooth. He further discloses a method determining the delay parameter (D) of said one of the plurality of external devices. See page 2446, section III.

Therefore it would have been obvious to one with ordinary skill in the art at the time the invention was made to provide the above teachings of Yang Ick Joo to Kalia in order to improve system performance by considering the traffic characteristics such as he delay parameter.

Regarding claim 10, Yang Ick Joo further discloses a method wherein the communication priority decision unit calculates the priority values based on a Formula, as follows:

$P = aT + (1- a)D$

where a denotes a weighted value, T denotes a class parameter, and D denotes a delay parameter. See page 2446, section III.

Regarding claim 11, Kalia discloses a method further comprising comparing a maximum priority value with a priority value of a first external device and the priority values of said at least one other of said plurality of external devices , and when the priority value of the first external device is smaller than the maximum priority value, a second external device is determined to have the maximum priority value and an opportunity for transmission, and communication with the second external device is initiated. See page 717, section A – Priority and K-fairness policies for TDD MAC layer. Here it is determined that the maximum priority connection is Master-slave connection in the 1-1 state. Further when it is determined that when the Master-Slave connection of the other external devices is at 1-0 or 0-1 state, the connection is sacrificed to a 1-1 connection state thus allowing the second device with 1-1 state to continue with the transmission.

Regarding claim 12, Kalia further discloses a method wherein, when initiating communications with the second external device, the queue status detection unit detects an amount of unit data being sent to/from the second external device, and changes a class parameter of the second external device (see page 718, paragraph 5 where according to amount of data to be sent or otherwise according to slot utilization, Master-Slave pairs are divided into different classes), and the counter decreases the number of giving-away times of the second external device and increases the number of giving-away times of the first external device so as to change delay parameters of the first and second external devices (see page 717, last paragraph)

Regarding claim 13, Kalia discloses a method wherein, when it is determined that the second external device has the maximum priority, the priority values of the first and second external devices are updated, by using at least one changed class parameter and at least one delay parameter. See page 718, paragraphs 5 and 6 (here the time of arrival of the packets indicates the delay parameter).

Regarding claim 14, Kalia discloses a method wherein, if the priority value of the first external device equals the maximum priority value, the first external device is determined to have an opportunity for transmission, and communications with the first external device is initiated. See page 717, last paragraph.

Regarding claim 15, Kalia further discloses a method wherein, when initiating communications with the first external device, an amount of data being transmitted to/from the first external

device is detected, and a class parameter of the first external device is changed. See page 718, paragraphs 5 and 6.

Regarding claim 16, Kalia further discloses a method wherein the first external device is updated by using a changed class parameter. See page 718, paragraphs 5 and 6.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kumar [US 6,657,987] Scheduling methodology for connections with QoS constraints in a polling based Media Access Control (MAC)

Rinchiuso [US 6,920,119] Method for scheduling and allocating data transmissions in a broadband communications system

Lee [US 2004/0085981] Wireless communication system and method using the same

Ozer [US 7,075,890] System and method to provide fairness and service differentiation in ad-hoc networks

M.Kalia, et al. "MAC scheduling and SAR policies for Bluetooth: a master driven TDD pico-cellular wireless system" Mobile Multimedia Communications, 1999. IEEE International Workshop on San Diego, CA, USA 15-17 Nov. 1999, Piscataway, NJ, USA, IEEE, US November 15, 1999, pages 384-388, XP010370692 ISBN: 0-7803-5904 6

Jyothsna Kalvala et al "Differentiated priority scheduling and adaptive segmentation for Bluetooth piconets", IEEE, Proceeding of the 39th Hawaiian International conference on system sciences, 2006

Jong Soo Oh et al "Differentiated fairness guaranteed scheduling policies for Bluetooth", IEEE, pages 923-926,2002

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sujatha Sharma whose telephone number is 571-272-7886. The examiner can normally be reached on Mon-Fri 7.30am - 4.00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew D. Anderson can be reached on 571-272-4177. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Sujatha Sharma
January 28, 2007